

SUMMER ACTIVITIES OF THE LAPLAND LONGSPUR ON BAFFIN ISLAND

BY GEORGE M. SUTTON AND DAVID F. PARMELEE

FROM June 14 to August 22, 1953, we studied the birds of southern Baffin Island, while living at the Royal Canadian Air Force Base near the head of Frobisher Bay. Among the buildings the Lapland Longspur (*Calcarius lapponicus*) was the most noticeable, if not actually the commonest, bird. With the Snow Bunting (*Plectrophenax nivalis*), Horned Lark (*Eremophila alpestris*), Water-Pipit (*Anthus spinoletta*), and Semipalmated Plover (*Charadrius semipalmatus*), it was in evidence most of the time, both day and night, in the latter half of June and early July.

The longspur inhabited all wet grasslands of the vicinity, notably those of the extensive flats just north of the Base, and of Davidson Point, a mile or so west of the Base, near the mouth of the Sylvia Grinnell River (Fig. 1). Not all longspur-inhabited meadows were low, extensive and level, however. Sloping ones, of varying size and shape, but often only two or three rods wide, bordered tiny snow-fed streams among the foothills. More level ones, of greater elevation, occupied depressions on the hilltops or formed the margins of lakes. The commonest bird of rocky country and therefore of the region as a whole was, of course, the Snow Bunting; but wherever there was a wet, grassy meadow the longspur was apt to be. Wynne-Edwards (1952:385), who considered the longspur the commonest bird of the low ground at the head of Clyde Inlet, Baffin Island, in the summer of 1950, found it reaching a "density of one pair in 5-15 acres (2-6 ha.)" in the most suitable habitats—i.e., the "wet tussocky meadows." Soper (1940:14) mentions the grass tundra's being "particularly rich in nesting Lapland Longspurs . . ."

On our brief visit to a large lake (Lat. 68° 31' N., Long. 71° 22' W.) in the Wordie Bay district, along Baffin Island's west coast, on August 8, we saw two longspurs. They were in the only stretch of grassy tundra we found in that barren area. Along the southeast shore of Lake Amadjuak, on the other hand, we saw many longspurs on August 8 and 15. Here (Lat. 64° 38' N., Long. 70° 28' W.) low, wet grassland stretched in every direction about us. At Cape Dorchester (Lat. 65° 20' N., Long. 77° 10' W.), on August 11, the longspur was decidedly the commonest passerine bird. A vast area of grass tundra, much of it wet, lay about the lake on which our amphibious aircraft alighted.

Precisely why wet grasslands are so all-important to the longspur may be difficult to say. Availability of insect food for the nestlings, of dead grass for building material, of nest-sites not readily accessible to certain predators: these probably have a part in determining the matter. To be attractive the

terrain must be more than low and flat; if too well drained, too gravelly, too bare, it will not do. Dry, firm, thinly grassed areas just north of the Base were inhabited by Horned Larks and Semipalmated Plovers, but the longspurs lived elsewhere—a stone's throw away, in the wet, grassy places. Facts of this sort, to be appreciated fully, must be observed and experienced day after day. When a visitor first perceives the noisiness and activity of the tundra's summer birdlife he is apt to feel that the many birds about him live everywhere, but he soon learns that every bird has a special habitat.



FIG. 1. Lapland Longspur nesting habitat. Photographed August 11, 1953, near the head of Frobisher Bay, Baffin Island. Nest 8 was between grassy mounds at lower left.

Our very first observations of longspurs (June 14) were of special interest. Our plane arrived about midnight. The air was cold. We were taken to our quarters in the half-light. Yet atop a wooden pole a male longspur was singing; and below our window, near some drowsy sledge dogs, a female longspur was looking for food. The pole referred to, as well as a considerably higher flag-pole not far away, were, we were soon to learn, almost constantly in use as song-perches. At least two male longspurs of the vicinity apparently had given up flight-singing altogether and were using the poles instead. Males defending territories off to the north, away from the buildings, often sang on the wing. We never saw a bunting, lark, or pipit singing from the pole-tops.

On June 15, a raw windy day, we saw many longspurs. They were commonest in the snow-free lowlands just north of the Base, but we saw them also

on the slopes leading up to the high interior. Here the ground was half white with the remains of drifts, some of them several feet thick. Wherever we went that day we heard longspur song, but we witnessed only three flight-songs; perhaps because of the wind, most of the singing was from the ground. Buntings and longspurs seemed to be equally common in some areas, but buntings were decidedly the commoner of the two on the rocky slopes. Most of the buntings obviously were paired. As for the longspurs, we were not so sure: repeatedly we came upon a male or female by itself, feeding quietly in a grassy spot. Nowhere did we see a flock of buntings or longspurs.

Late that morning we found a longspur nest containing five eggs (Nest 1). We found it not through flushing the female, but by happening to see wings fluttering just above the ground several rods ahead of us. Curious as to why any bird, regardless of its species, would flutter in that way, we walked forward, flushed a female longspur at a distance of a few feet, and found the nest, which was deep in the turf and warmly lined with fine grasses and white ptarmigan feathers (FIG. 2). The female flew off rather slowly with tail spread wide and alighted about 15 feet away. Here she puffed out her feathers and shook herself. Though obviously perturbed, she emitted no cry. Presently she flew again, this time in narrow circles about us, alighting occasionally, but giving no callnote. The male did not appear. We marked each of the eggs with a red dot, for we were not sure that the clutch was complete. The nest was about 30 paces from a Semipalmated Plover's nest containing two eggs. The two nests, though near each other in a physical sense, were discrete ecologically; that of the longspur was in wet, spongy grassland, that of the plover in hard-packed, comparatively dry gravel.

That afternoon we returned to take photographs. Again the female longspur flushed closely, flew off without feigning injury, and circled silently. Her mate did not appear. When, now and then, she alighted for a few seconds, her manner was very broody. We concluded that, whether she had finished egg-laying or not, she was incubating in earnest.

June 16 we visited the nest again. This time the female flushed at considerable distance. One egg was resting on the other four—a result, possibly, of the female's sudden departure. The nest was sheltered to the east and northeast by a fold of turf, the ground thereabout apparently having been disturbed by construction work. Nowhere in the immediate vicinity did we see or hear a male bird.

During latter June and the first nine days of July we continued to find longspur nests almost daily (see Table I). Nest 1 was only about 300 yards north of the Base, so we visited it regularly. We usually flushed a bird from the nest, and this bird invariably was the female. Usually she did not fly until we were within three or four feet. Never did she feign injury. We

never saw the male go to the nest during the period of incubation. This statement is valid, for we spent much time in a blind placed between the longspur and plover nests.

At 11:45 p.m., June 25, Parmelee visited Nest 1, finding one chick hatched but not yet dry, another hatching and still largely in the egg. When Sutton visited the nest 3 hours and 35 minutes later (3:20 a.m., June 26), he found one young bird, completely dry, and what he thought to be four eggs. The



FIG. 2. Lapland Longspur Nest 1, showing dark eggs and lining of winter ptarmigan feathers. Photographed June 15, 1953.

second chick obviously had not emerged. When we both visited the nest at 9:30 a.m., June 26, there were three eggs and one chick. What had happened to the other chick or egg we could only guess. Both parents were near the nest, but only the male gave alarm cries. The down of the chick was pale grayish buff with dark brown tipping.

Day after day we found the one chick and three eggs in the nest. July 2 we saw the male approach the nest several times, but never with food in his mouth. We banded the well-developed nestling July 4. July 5 the nest held only the three eggs. We failed to find the young bird in the vicinity, but the

behavior of the female parent clearly indicated that the chick was not far away. It had been in the nest about nine days. The "desertion of the nest by the young on about the 9th day, with the wings still in pin feathers and three to five days more before they can fly," is discussed by Wynne-Edwards (1952:386).

Nest 2. Found June 17. Five eggs. In short grass on a foot-high tussock which was surrounded by water four inches deep; in a 10-acre meadow in the high interior a mile east of the Base; a quarter of a mile from the nest of a Snowy Owl (*Nyctea scandiaca*). The female longspur flushed at about eight feet. She feigned injury only slightly as she flew off. We did not visit the nest regularly. June 24 we watched the female go to it. She wandered about for a time, not much agitated so far as we could see, then flew in and settled promptly. On July 4 and 6 there were five chicks in the nest. July 9 the chicks were so large that the nest seemed badly overcrowded. As the brooding female flushed she gave a low twitter, a callnote new to our experience. As if in response, the male appeared and both parents gave cries of alarm.

Nest 3. June 20. Not quite finished; lined with raven feathers. In the side of a tussock about five feet from the edge of a shallow pond in muddy marshlands on Davidson Point. We found the nest not by flushing the female, but by carefully searching an area guarded by a pair of longspurs.

We did not visit this nest often. June 27 it held four eggs. The glossy black feathers of the lining curled upward and inward, almost hiding the eggs. July 2 there were still four eggs. July 12, on our last visit, there were four young birds, almost ready to leave.

Nest 4. June 20. Three eggs (probably an incomplete clutch). On Davidson Point, in the middle of a 20-foot strip of turf between two large, shallow ponds. Found by watching the female which was, when we first saw her, about fifteen yards from the nest. After standing high and looking about anxiously, she flew straight to the nest. We flushed her, ascertained the number of eggs, and saw her return to them. On the far side of one of the ponds we collected a handsome male (GMS 11717), not realizing that it was her mate. When next we visited the nest, on June 27, we found it torn out and scattered.

Nest 5. June 22. Five eggs. Deep in grass about 350 yards north of the Base, six paces from the edge of a small pond, and 50 paces from a Horned Lark nest in a bare area near a gravel pit. Lined with white ptarmigan feathers and dog fur. Found by flushing the female, which flew off without feigning injury. June 23, 24, 26, 27, and 28 we flushed the female from five eggs. June 29 there were five chicks, all of which had hatched within the preceding 24 hours. Between July 1 and July 5 one of the chicks disappeared. We visited the nest daily from July 5 to 10, invariably seeing the female (usually with food in her beak) at or near the nest. July 8 we paid special attention to the male. He was very tame. If we lay down, he approached us to within five or six feet, apparently curious rather than perturbed. His food loads were smaller than those of his mate, often consisting of one large insect, such as a crane fly (*Tipula arctica*). On July 9 the nest held four well developed young. At 12:55 a.m. and 6:40 a.m., July 10, only two young were in the nest. We failed to find the others in the vicinity. At 4:00 p.m., the nest was empty. The nestling period had been at least ten days, at most, 12 days. The young were not able to fly when they left the nest.

Nest 6. June 22. Five eggs. Near the edge of a gently sloping wet meadow a quarter of a mile southeast of the Base, in moss and grass on a comparatively dry mound. Found

by flushing the female, which flew off feigning injury only slightly. We marked the nest with a flimsy cairn of stones. The cairn fell apart and we lost the nest for some time, but we re-discovered it July 7, on which date it held four good-sized young. We did not visit it thereafter.

Nest 7. June 23. Four eggs. In moss and grass in marshy spot on slope just east of Base, about five feet from the edge of a small, shallow pond; slightly sheltered by the leaves of a tiny rhododendron, about six inches from the edge of a huge sunken rock. Found by watching (1) a feeding male; (2) a female, which suddenly appeared, chased a rival female out of sight (a distance of at least 60 yards), returned, and flew directly to the nest. Visited daily June 23 to July 8, except July 6. Three young hatched between our visits of June 27 and June 28. The egg which did not hatch remained in the nest until July 5, and was not seen thereafter. We tried to capture the female with a net, but failed. The three young left the nest between our visits of July 7 and July 8. On July 8 we found all three birds, well scattered, but still unable to fly. Both parents were feeding them. The one farthest from the nest—up the slope about 50 yards—apparently was being fed exclusively by the male. The nestling period had been at least 10 full days.

Nest 8. June 25. Five eggs. Among moss and grass in crevice between two mounds; about 14 inches above wet humus in meadow bordering rocky base of foothill, about 75 paces north of Nest 1. Found by flushing the female, which flew off without feigning injury. Visited June 26, June 27, June 28 (five eggs), and July 1 (four young). What had happened to the fifth egg or young we did not know. From July 1 to 10 we visited the nest regularly. July 5 there were only three young. That day Sutton, partly hidden among rocks 60 yards away, recorded observations from 1:10 p.m. to 2:40 p.m. The female ranged widely for food, coming in with a large mouthful of insects three times, and carrying off a fecal sac after each feeding. Haviland (1916:236) "never saw food in the bill of a bird which was feeding young." The male gathered no food, made no move to accompany his mate, did not fly to greet her when she came in, and did not go to the nest. Instead, he gave alarm notes at a rate of 19 to 22 per minute (checked with a watch) virtually without break, during the whole period. He changed position six times. For about 20 minutes he called from a hummock at nest-level half way between Sutton and the nest. He gave two calls—the familiar *ee-yee* or *chee-yee*, and a softer *yee-ur* or *your*. For a quarter of an hour he was well up the slope to the east, but his calls continued to be distinctly audible. He did not once give chase to another bird; the female did not join him; and he did not sing. The sun was warm. At 2:40 p.m. the nestlings were panting heavily. One of them, when touched with a finger, begged with mouth wide open. The sound of begging was audible to Sutton at about one foot distance, inaudible at two feet.

At 6:00 a.m., July 10, two young were in the nest, but a large moist dropping a few inches away indicated that the third had departed not long since. The two young departed from the nest before 4:20 p.m. that day, leaving before being able to fly. The nestling period had been at least nine days. The empty nest was quite clean. Haviland (*loc. cit.*) reports that nests observed by her in Lapland were "always foul."

Nest 9. June 27. Two eggs, both strikingly gray rather than brown. In clump of moss, among thin grass, in tussock seven inches above wet humus; about 60 paces south of Nest 1. A pair of longspurs was in the vicinity, but the nest probably had been deserted before we found it. We never flushed a bird from it. On July 1 Parmelee examined it carefully, finding a third egg (gray) buried in the lining. On July 2 he found a fourth egg, also gray, punctured and empty, seven paces north of the nest. We put the four eggs into the nest to see what would happen to them. On July 5 they were all there, the

empty one crushed. On July 8 another egg was broken and empty. The shell bore what appeared to be double tooth-marks, almost certainly those of a lemming. Both the Colared Lemmings (*Dicrostonyx groenlandicus*) and Brown Lemmings (*Lemmus trimucronatus*) were abundant in the area. On July 21 the nest still held two eggs, both intact.

Nest 10. June 27. Two eggs. Near the Base's dump, six paces from the water's edge in wet meadow bordering a deep pool which flanked a rocky hill. Found by flushing the female, which popped out and flew off swiftly. We marked the eggs. On June 29 we found the lining (grass only; no feathers) strewn about widely. In what remained of the nest-cup were two eggs, one of them marked. About 15 inches away, almost side by side, were two more eggs, one of them marked. Marvelling that any predator could have torn the nest out without destroying its contents, we returned the eggs to the nest-cup. They were still there, intact, July 1, on which date we collected them.

Nest 11. June 27. Six eggs. On Davidson Point, in tussock six inches above water along edge of small pond, 51 paces from Nest 3. Found by flushing the female, which flew off without feigning injury. On July 2 there were four chicks and two eggs; on July 12, one chick and one egg. The nestling was large and alert looking, as if ready to bolt, but when touched it merely crouched, making no attempt to hop or flutter away. It could not fly.

Nest 12. June 27. Five eggs. On bank of small stream, three feet from swift water a foot deep, among moss, grass, and *Cassiope tetragona*; about a hundred yards from the high-tide mark. Found by flushing the female, which ran from the nest with wings spread and flew on reaching the stream's edge. Visited on June 29: five eggs, female flushed. June 30: watched female fly at least a hundred yards to nest. July 1: five eggs, no adult bird there, nest appeared to have been disturbed. July 12: four chicks and one egg. July 16: one egg and mass of feather-sheath particles, but no droppings, in the nest; two young birds, side by side, about three feet from the nest. The female parent was close by, chirping anxiously. The young, though well feathered, could not fly.

Nest 13. July 1. Five eggs. In exposed position among lichens, moss and short grass in comparatively dry meadow several hundred yards northwest of Base; 12 paces from a shallow stream, and about 50 paces from a Semipalmated Plover's nest—the latter on still drier, more gravelly ground. We flushed the female on June 30 but failed to find the nest that day. On July 1 she flushed in the same manner, flying directly from the eggs, alighting with wings spread, and running a few feet with wings partly open. On July 6 the nest held one chick and four eggs; on July 7, four chicks and one egg. The fifth egg hatched, but we do not know when. On July 11 (raining steadily) the five young birds were wet; we saw neither parent, but the nestlings appeared to be in good condition. On July 12 we color-banded the brood, green on right leg. While receiving their bands the nestlings opened their mouths repeatedly, as if for food, but if they made any sound it was exceedingly faint. At 6:30 a.m., July 16, one nestling was still in the nest. It could not fly. We failed to find others of the brood in the vicinity.

Nest 14. July 1. Five small young. North of the Base several hundred yards, in mossy hummock about two feet from a shallow pool. About 60 paces from a Semipalmated Plover's nest which was in a drier, more gravelly area. On July 1 we saw the male go to the nest with food. On July 6 and 7 (four young) we saw only the female parent in the vicinity. On July 11 the nest was empty.

Nest 15. July 2. Five eggs. In marsh on Davidson Point, deeply sunk in moss and well sheltered by grass. When female flushed she flew off without feigning injury. Visited by us only once thereafter, July 12, when there were five fairly well developed young.

Nest 16. July 2. At 10:00 a.m., held three eggs and one chick; at 3:10 p.m., three chicks and one egg. In wet meadow just north of Base, about five feet from the edge of a shallow pool. Bottom of nest-cup about an inch above water-level. July 6: four young, the female close by, chirping in alarm. July 8, 9, and 10: four chicks. On July 10 we visited the nest at 1:00 a.m., 6:47 a.m., and 4:25 p.m. The young were large and evidently about ready to leave. One of them, a female, we collected (GMS 11748). Though quite well feathered it was flabby and made no attempt either to run or to fly. July 11 the nest contained two chicks only, and we failed to find the other in the vicinity. Both parent birds chirped incessantly. July 12 the nest was empty except for particles of feather-sheath.

Nest 17. July 5. Three eggs. Located in a comparatively dry spot, but close to several small shallow pools, high on slope east of Base in small rock-rimmed meadow, throughout which the principal plants were moss and lichens rather than grasses. The female, a remarkably confiding bird, we caught and banded on July 7. On July 8 we recorded observations at the nest from 9:20 a.m. to 11:30 a.m., seeing only the female except at 9:45, when a male, without food in his mouth, flew over, giving a *pit-i-tit cheer* cry, and the female instantly left the nest, following him down the slope out of sight. Within a short time she returned alone and went to the nest. At 11:30 a.m., July 8, the nest held three eggs. July 10: three chicks. On July 11 we saw the female take food to the nest, but we did not see the male. On July 16 the nest held two well developed young, both dead.

Nest 18. July 5. Four eggs. In meadow just north of Base, in moss at foot of hummock, eight paces from edge of small, shallow pool; 33 paces from Semipalmated Plover's nest in much drier, more gravelly ground. Female flushed without feigning injury. July 6: four eggs. July 7: two chicks and two eggs. July 8: four young. On July 11 we observed the male, as well as the female, taking food to the nest. On July 15 we color-banded the brood, red on right leg. On July 16 the nest held four large young. It was empty on July 21.

Nest 19. July 5. Four eggs. In damp meadow north of Base, at foot of mossy mound. Neither stream nor standing water close by. Nest held four eggs on July 7, three young and one egg July 8. The three chicks had hatched within about 24 hours. One egg did not hatch. On July 8, we saw both male and female carrying food to young. That day we caught and banded the female. We saw young in the nest as late as July 16, but on July 21 it held only the one egg.

Nest 20. July 8. Five eggs, unusual in that their ground-color was pale olive and their markings few and scattered (Fig. 3). At very edge of mossy islet in wet meadow north of Base, the islet surrounded by water several inches deep. Bottom of nest-cup less than an inch above water-level. Lining without a trace of feathers, fur, or bog cotton. When female flushed she flew off swiftly. We flushed the female on July 9 and 12 (five eggs), but the nest continued to be so wet that we were not surprised to find it deserted on July 15. The eggs were still there on July 17, one of them badly broken (embryo well developed).

Nest 21. July 8. Four well developed young. In wet meadow north of Base, between two tussocks, well sheltered by grass. Found by watching female go to it with large mouthful of food. On July 9 the four young appeared to be about ready to leave. The nest was empty on July 10. We never saw a male bird in the immediate vicinity of the nest.

Nest 22. July 9. Two chicks (one not fully hatched) and one egg. In top of islet of moss and grass in meadow in high interior several miles northeast of Base. We did not flush the female but saw her near the nest. We did not visit this nest again.

From Table I these facts are apparent: (1) Of a total of 97 eggs laid in 22 nests, 22 did not hatch, but only one of the 22 nests was utterly destroyed, contents and all, by a predator. (2) Of 75 chicks known or believed by us to have hatched, 62 apparently left the nest successfully. (3) In each of five nests, a single chick disappeared prematurely. If predation were responsible



FIG. 3. Lapland Longspur Nest 20, showing pale eggs and lining wholly of grass (without feathers or hair). Photographed July 8, 1953.

for this loss it was predation of an unusual sort, for such predators as ravens (*Corvus corax*) and weasels (*Mustela erminea*) usually make off with whole broods. (4) The average clutch-size for 19 nests was 4.5 eggs—a considerably lower figure than that reported by Sutton (1932:240) for Southampton Island, where the great majority of nests in the summer of 1930 held six eggs. In obtaining average clutch-size for the Frobisher Bay area in 1953, we decided against including Nests 4, 9, and 10 in our calculation, for the clutch might not have been complete in these nests. (5) The reproductive cycle ended soon after mid-July, there being no unusually late broods or other evidence of two-broodedness.

Nineteen of the 22 nests discussed above were lined with grass and, more or

less extensively, with white winter ptarmigan feathers, or dog hair, or both. Neither of the two grass-lined nests was successful, but this may have been a mere coincidence. Nest 3 was lined with raven body feathers and grass. In no nest did we find a single *summer* ptarmigan feather. The only ptarmigan we recorded anywhere on Baffin Island in 1953 was the Rock Ptarmigan

TABLE I

DATA FOR LAPLAND LONGSPUR NESTS, BAFFIN ISLAND, 1953

Nest No.	Date found; contents on that date	Clutch size	Eggs known not to have hatched	Observed or estimated date for hatching of first chick	Observed latest date for young in nest	No. young known or believed to have left nest successfully
1.	June 15 (5 eggs)	5	3	June 25	July 4	1
2.	June 17 (5 eggs)	5		June 29 (est.)		5
3.	June 20 (unfinished)	4		July 2 (est.)		4
4.	June 20 (3 eggs)	3?				0
5.	June 22 (5 eggs)	5		June 29	July 9-10	4
6.	June 22 (5 eggs)	5	1	June 28 (est.)		4
7.	June 23 (4 eggs)	4	1	June 28	July 7	3
8.	June 25 (5 eggs)	5	1	July 1 (est.)		3
9.	June 27 (2 eggs)	4?	4			0
10.	June 27 (2 eggs)	4?	4			0
11.	June 27 (6 eggs)	6	1	July 2	July 11-12	5
12.	June 27 (5 eggs)	5	1	July 6 (est.)		4
13.	July 1 (5 eggs)	5		July 6	July 15-16	5
14.	July 1 (5 young)	5		July 1 (est.)		4
15.	July 2 (5 eggs)	5		July 3 (est.)		5
16.	July 2 (3 eggs, 1 young)	4		July 2	July 11	4
17.	July 5 (3 eggs)	3		July 9 (est.)	July 16 (2 dead)	0
18.	July 5 (4 eggs)	4		July 7	July 16	4
19.	July 5 (4 eggs)	4	1	July 8		3
20.	July 8 (5 eggs)	5	5			0
21.	July 8 (4 young)	4		July 1 (est.)		4
22.	July 9 (2 young, 1 egg)	3	?	July 9		?

(*Lagopus mutus*), and this species was very scarce about the head of Frobisher Bay. Blair (1936:302) discusses an interesting correlation between scarcity of ptarmigan and absence of feathers from longspur nests from 1924 to 1927 in Norway. Many nests found by him during that period contained only three or four feathers, and from two nests "feathers were lacking, the lining being entirely of dry grass."

NESTING SCHEDULE

In the Frobisher Bay area, in 1953, egg-laying must have started about June 10. We know that in Nest 1 the first chick hatched June 25. Wynne-Edwards (1952:385) states that the incubation period in "each of two exactly known cases" at Clyde Inlet was 12 days. That being the case, the fifth egg in Nest 1 probably was laid about June 14, the first egg, June 10. Many female longspurs did not start laying this early, however; or, if they did, their nests came to grief; otherwise Table I would certainly reveal more June dates than it does among the observed or estimated earliest dates for hatching. The table clearly shows that hatching in 13 of the 22 nests started on or after July 1. Note, too, that Nest 1, our earliest nest, was far from 100% successful. Three of the five eggs did not hatch, and another probably did not hatch properly. This failure may well be attributable to severe temperatures. Meteorologists at the Base informed us that the weather was unusually mild for several days in late May and early June. Some of the pipits which started nesting during that period were successful in rearing their young. We saw young pipits, well able to fly, as early as June 30 (see Sutton and Parmelee, 1954a). Comparably well developed young longspurs we did not see until July 12.

In the Nettilling Lake area of Baffin Island, in 1925, Soper (1928:114) found the first longspur egg of the season on June 14. That same day he examined several nests which were completed and ready for eggs. In the Bowman Bay area, in 1929, Soper (1946:423) found "the first completed nest, with a single egg" on June 26. On Southampton Island, in 1930, first eggs for the season were laid about June 17 (Sutton, 1932:240). Taverner and Sutton (1934:80) reported June 5 as the date for the earliest egg at Churchill, Manitoba, in 1931. Bailey (1948:299) found eggs as early as June 14 in the "bleak windswept tundra" near Cape Prince of Wales, Alaska. In the "more favorable" Kotzebue Sound area he found a set of five eggs on June 1. Here the first egg could not have been laid *later* than May 28.

We were especially interested in late nests. On June 19, along the east bank of the Sylvia Grinnell River, we happened upon a female with grass in her bill, but her mate continued to give alarm cries and she would not go to her nest. Finally she dropped the grass and flew off, followed by the male. Nest 10, a late nest, came to grief through predation. Had all gone well there, the four chicks would have hatched about July 11 and left the nest about July 20. On July 19, we saw young out of the nest, but unable to fly, near the mouth of the Jordan River, 16 miles west of the Base. Our latest date for a nest with a living egg was July 9; for a nest with one or more young birds, July 16; for young birds out of the nest but unable to fly, July 19. We obtained no evidence whatever of two-broodedness (Witherby, 1948:146; Salomonsen,

1951:531; Nicholson, 1930:293), and no nest that we examined appeared to have been used twice (Wynne-Edwards, 1952:385).

Aware of Wynne-Edwards's statement (*loc. cit.*) that hatching occupied "from two to four days," we paid special attention to this part of the breeding cycle. We observed no simultaneous hatching of the whole brood; but at Nests 5, 7, and 19 the 5, 3, and 3 eggs, respectively, hatched within approximately one day; at Nest 18 the four eggs hatched within approximately two days; and at Nest 13 the 5 eggs hatched within two (possibly more than two) days. At Nest 16, one chick was in the nest when we first saw it at 10:00 a.m., July 2; by 3:10 that afternoon two more chicks had hatched. The fourth egg hatched, but we did not ascertain the time of hatching.

BEHAVIOR OF NESTLINGS

Ornithologists who have studied the nesting of such common American birds as the Field Sparrow (*Spizella pusilla*) and Song Sparrow (*Melospiza melodia*) are familiar with the way in which a nestful of well-developed young may, whether able to fly or not, "explode" in all directions when the nest is disturbed or when the parent utters certain cries of alarm. Such behavior apparently is not characteristic of the Lapland Longspur. The tendency for the nestlings to lie low rather than flutter off probably is correlated with their inability to fly at the normal time of departure from the nest. What we have thus far reported clearly shows that young longspurs leave the nest when nine to ten days old, or a little older. Pleske's (1928:145) surmise from "analogy" that "young leave the nest after 14 days (approx.);" apparently is quite wrong. Young birds on leaving the nest are wholly unable to fly. The feather development of a flightless, 10-day old bird is well illustrated by Grinnell (1944, plates 24 and 25). So there is a brief period in midsummer when longspur nests are empty, and the flightless young—neither nestlings nor fledglings, properly speaking—are scattered here and there all over the tundra. Of the nestlings we color-banded not one did we recover. Our earliest date for a strong-flying young bird was July 12. That bird (male, GMS 11750) we shot after three of us had tried for some time to catch it in the hand. Its tail was 39 mm. long. A few tufts of natal down clung to some of the wing coverts and rump feathers. In 1937 Bray found "most young longspurs . . . awing before July 13" in the region of Fury and Hecla Strait (1943:534).

Another interesting fact about the nestling longspur (*i.e.*, the young bird *while it is in the nest*) is that it is comparatively voiceless. (In the discussion of Nest 8, see our comment about the faintness of the begging cry.) Not only do nestlings have a very weak voice; when handled or disturbed, they usually remain silent. Not so the young bird after it had left the nest. Now it gives a loud *tchip* food-cry, through which it can be located by parent or human be-

ing. A loud *chee-chee-chee*, which we heard from a young bird out of the nest on July 22, we interpreted as a food cry; but it may have been a cry of fear or distress. We heard it just after one of the parent birds had given alarm notes. A loud *chee-chee-chee* is characteristic of a frightened 12-day old bird held by its toes.

Young birds on first learning to fly have an amusing way of springing from the grass and dashing off with great assurance, only to find themselves suddenly unable to go farther, at which instant they fold their wings and flop to the ground, sometimes tumbling along on the moss as a result of the momentum. Such young birds may appear to be crippled. On July 25 we chased, and probably could have caught, such a poor flier.

ACTIVITIES OF ADULT MALES

Blair (1936:103) states that in arctic Norway the male longspur, as well as the female, incubates the eggs and broods the young. We never flushed a male from a nest though several times we saw males take food to nests containing young, and we believe that males regularly take charge of the oldest members of the brood as these flightless chicks leave the nest.

At many nests visited regularly by us we noticed that the male was much more given to voicing alarm and protest than the female. We already have discussed one case of this sort (Nest 8). Another case we observed July 3. Here we did not know where the nest was located; but the female was virtually silent while the male continued to give alarm notes of four distinct sorts—the well-known, far-carrying *ee-yee*, which has been transliterated by Haviland (1916:234) as *whee-ee*, and by Salomonsen (1951:532) as *ee-yü*; a short *ear* or *err*; a rough, sharp *chee-ah*; and the familiar *pit-ick* or *fit-ick*, which may not be an alarm note at all. The male gave these cries, and these only, over and over, in about the order used here. He did not repeat himself directly.

While nests are being built and eggs laid, singing by the males is, we presume, primarily a matter of nest-territory defense, though some midsummer singing may be advertisement for a mate. The song-period was at its height in the last week of June. Singing was not exclusively a bright weather activity. On the evening of June 23, while rain was falling steadily and the sky was cloudy and dark, we observed several males singing flight-songs. On June 30 several males sang flight-songs in the heavy fog. High wind stopped the flight-singing, however, and sometimes it stopped singing of any sort. Territory-defense through singing had its amusing aspects. On June 26, on the long slope leading eastward into the high interior, we saw two males singing together in the air, as if in complete accord. They alighted about five feet apart, each on a separate stone. Here, with heads lowered and plumage lifted, they threatened each other with wide open mouths, but remained perfectly

silent. A male observed June 23 near Nest 7 did not join his mate in driving a rival female from the nest-territory.

The longspur was the first of the passerine birds to stop singing as summer advanced. Our latest date for a flight-song, indeed for a longspur song of any sort, was July 6. That day we witnessed several scattered performances. We heard several Horned Larks singing as late as July 12, a Water-Pipit singing briefly as late as July 23, and a Snow Bunting in full song (from a rock, not from the air) as late as July 27. July, 1953, was memorable for its foul weather. The recorded mean maximum temperature for the 31-day period was 49.2° F., the mean minimum, 37.6°. Soper (1928:114) reported that in the Nettilling Lake area, in 1925, the male longspurs ceased singing about July 20. July temperatures were "fairly uniform" that year, "mornings registering from 50 to 60 degrees and at mid-day, 10 to 14 degrees higher" (1928:16). In the Bowman Bay area, in 1929, longspur singing stopped between July 12 and 15 (Soper, 1946:423).

It is our carefully considered belief that shortly after the young leave the nest the sexual bond holding males and females together breaks completely. We also are convinced that no such bond as that which holds Horned Lark families together during late summer exists among Lapland Longspurs. We are puzzled by Dalgety's (1936:582) report of seeing in Greenland, as late as August 24, "family parties which had not flocked together." Once the young leave the nests and begin to scatter, they are fed for a while by the males (if they happen to be older and leave the nest first) or by the females (if they happen to be younger and to leave the nest later). All our observations during the latter two weeks of July and first two weeks of August show clearly that adult males, adult females, and young birds were living comparatively solitary lives during that period. Repeatedly we find in our notes such entries as this: "All birds seem now to be 'singles'—single adult males, single adult females, single young birds" (Sutton, July 27); or this: "Never see family groups together and rarely see male and female together—always separate birds—a dull, ratty male, a ratty female, or a trim young one, richly colored and fat-looking" (Sutton, July 31). All adult birds which we saw August 16 appeared to be molting heavily. Pleske (1927:143, 144) reports an adult male in "perfectly fresh" winter plumage taken on New Siberia Island, August 14.

The attachment that three adult males had for each other we cannot explain. We saw these birds near Tarr Inlet, July 7, shortly after singing had stopped for the season. They fed and flew about together, though their behavior was not that of a flock. Their plumage was bright but worn-looking; their post-nuptial molt probably had begun.

ACTIVITIES OF ADULT FEMALES

Observers agree that the female Lapland Longspur builds the nest (Sutton, 1932:240-1; Witherby, 1948:146). We observed very little nest-building. A female with grass in her bill refused to go to the nest (June 19) probably because we were so near and so conspicuous. Near Nest 3 (not quite finished, June 20) we saw both the male and female, but only the female brought material and went to the nest. We observed little defense of nest-territories by females. On June 19 Sutton witnessed a fight, memorable for its ferocity, between two female Snow Buntings (see Sutton and Parmelee, 1954b:162), but we never saw female longspurs fighting in such a manner. Salomonsen (1951:528) says: "I have only a few times seen a female drive another female from its territory." At Nest 7, on June 23, we saw a female chase a rival female 60 yards or more. Birds are, we believe, more apt to be territory-conscious during the periods of egg-laying and incubating than later in the season, when food gathering requires so much effort. It is nevertheless interesting that on July 5 we saw two females approach each other closely as they gathered food in the grass. Though actually side by side, they displayed no animus.

Alarm notes of females seemed to be less varied than those of males. Both males and females frequently called *fit-ick* or *pit-ick*. The far-carrying *ee-ye* seemed to be given principally by males. A female we spent some time with on July 6 gave only one alarm note—*chure* or *ee-ure*. This seemed to be slightly more mellow than any alarm note we had heard from a male.

ACTIVITIES OF YOUNG BIRDS

Two well-feathered young birds, which we saw together near the mouth of the Jordan River on July 19, were wholly unable to fly, but strong on their feet. They were just out of the nest and must have been siblings. Between July 19 and August 2 we never saw two or more young birds together, nor an adult bird in company with one or more young ones. This was a period of molt. Such birds as we saw were apt to be ragged looking. Sometimes they flew with difficulty.

As late as July 25 young birds that we saw in flight were stub-tailed; but from July 27 on, all young birds appeared to have full-length tails.

Pleske (1928:148) states that young birds "gather into small flocks toward the middle of August, and for some while lead a nomadic life." We observed the first signs of autumnal flocking on August 2. That day, near the dump, in a disturbed soil area throughout which many herbaceous plants grew, we saw a large scattered company of longspurs and buntings feeding together peaceably. Young birds seemed to be somewhat more numerous than adults. The young were not adept at reaching the seeds, many of which they tried to shake from the stalks. When they failed to find enough seeds on the ground

they pulled the stems down and trampled them, or fluttered upward, yanking at the stalks with their bills.

NEST SUCCESS, SURVIVAL OF OFFSPRING, AND PREDATION

The fact that 17 of the 22 nests we had under observation were more or less successful, and that only one nest was known by us to have been totally destroyed by a predator, strikes us as being remarkable. The failure of Nest 20 may have been traceable to bad weather, to unfortunate choice of site, or to absence of feathers or other warm material in the lining; that of Nest 4 to our shooting of the male bird; of Nests 9 and 10 to molestation by lemmings; of Nest 17 to disappearance of the male bird, to bad weather, or to both. On July 22 a soldier brought us a stub-tailed young longspur he had found dead. So far as we know, however, no nestful of young longspurs perished during the July 17-21 cold spell so lethal to nestling pipits (see Sutton and Parmelee, 1954a). The fact that the numerous husky dogs did not destroy nests continues to amaze us. Foxes and weasels were extremely rare near the Base. The several Snowy Owls which nested in the vicinity preyed exclusively on lemmings. The Ravens of the neighborhood fed regularly at the Base's dump.

We found adult longspur remains in the stomach of a Pomarine Jaeger (*Stercorarius pomarinus*) collected at Lake Amadjuak, August 8, and in the stomach of a Parasitic Jaeger (*S. parasiticus*) collected near Cape Dorchester, August 11. We saw no jaegers of any species at the head of Frobisher Bay.

DESCRIPTION OF SPECIMENS

We collected four adult Lapland Longspurs, three males and one female, near the head of Frobisher Bay. Measurements in millimeters are:

GMS No.	Sex	Date	Wing	Tail	Culman	Tarsus
11705	Male	June 17	90	62	11	21.5
11717	Male	June 20	95.5	63.5	12	21.5
11724	Male	June 25	90	58	11.5	20.5
11725	Female	June 25	87.5	57	11	20.5

Salomonsen (1951:524) believes that a Greenland race of *Calcarius lapponicus* should be recognized. He measured the bills of 57 Greenland and 36 Scandinavian male specimens, finding the former to average 14.54 mm., the latter, 13.13 mm. in length. In his opinion, Brehm's name, *subcalcaratus*, should be used for the Greenland race. He states further: "The N. American population comes nearest to *C. l. subcalcaratus* and is best referred to that form . . ." Wynne-Edwards (1953:387) refers three males and three females from Clyde Inlet to the nominate race. Unless we took our bill measurements in some manner wholly different to that of Salomonsen, our Frobisher Bay birds are smaller-billed than Greenland birds and probably should be referred also to *C. l. lapponicus*.

The four eggs (possibly an incomplete clutch) from Nest 10 were preserved. These measure: 21.5 mm. \times 16.0, 22.0 \times 16.0, 22.0 \times 15.5, and 22.0 \times 15.5 (average: 21.8 \times 15.7 mm.). They are dark brown, scrawled, blotched and spotted with darker shades and with black.

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SUMMARY

1. The Lapland Longspur was one of the commonest birds at the head of Frobisher Bay, Baffin Island, in the summer of 1953. It nested almost exclusively in wet, tussocky tundra. A nest built among moss and lichens, rather than among grass, was unsuccessful.

2. Of 22 nests found by us, 20 were lined with grass and with feathers or fur. Two were lined only with grass. None had been used previously.

3. The female built the nest and incubated the eggs. During the egg-laying and incubation periods the male rarely, if ever, went to the nest. We never saw a male take food to an incubating female.

4. After the hatching of the chicks, the male was louder-voiced than the female in sounding protest while we were near the nest. During a mid-day period of observation at one nest the male devoted himself wholly to giving alarm cries, the female to feeding the chicks. At another nest, the male fed the young regularly.

5. The average clutch-size for 19 nests was 4.5 eggs.

6. Egg-laying started about June 10 and continued at least to June 29. Earliest date for a newly hatched chick, June 25; for a chick well able to fly, July 12. Latest date for a chick ready to leave the nest, July 16; for a chick out of the nest, but still unable to fly, July 19.

7. A predator scattered the lining of one nest without breaking any of the four eggs. In each of several nests a single chick disappeared prematurely. Two of four eggs in a deserted nest were chewed at, probably by a lemming.

8. Three eggs in one nest, three in another, and five in another, hatched respectively within a 24-hour period. At one nest, two of the four chicks hatched between 10:00 a.m. and 3:10 p.m. At several nests hatching of the brood extended over a two-day, or even longer, period.

9. Chicks remained in the nest nine or ten days and left while quite unable to fly. Chicks ready to leave the nest never "exploded" in all directions when disturbed.

10. We color-banded nine chicks (two broods) in hope of ascertaining the exact fledging period, but failed to recover a color-banded individual.

11. Singing was at its height during the last week in June and stopped altogether on July 6—long before it did in other passerines.

12. Pairs separated and broods scattered within a few days after the young

had left the nests. Between July 19 and August 2 we observed no longspurs in pairs or in separate family groups. After August 2 we frequently observed mixed flocks of longspurs and buntings.

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